

# (12) UK Patent Application (19) GB (11) 2 321 757 (13) A

(43) Date of A Publication 05.08.1998

(21) Application No 9810858.2

(22) Date of Filing 20.05.1998

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(51) INT CL<sup>6</sup>  
G09F 21/00 21/06

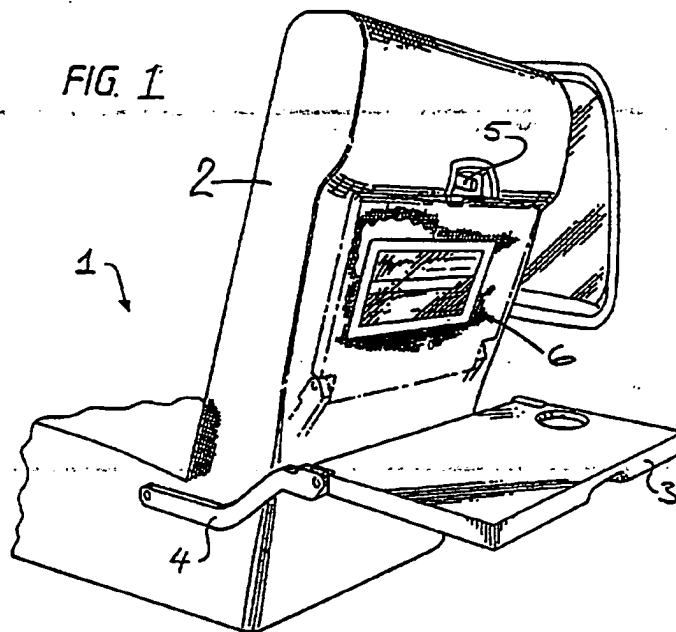
(52) UK CL (Edition P)  
G5C CFF

(56) Documents Cited  
GB 2311887 A EP 0779177 A WO 95/14588 A  
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(58) Field of Search  
UK CL (Edition P) G5C CER CFF  
INT CL<sup>6</sup> G09F

(54) Abstract Title  
**Advertising panel**

(57) Advertising display panels for passenger vehicle interiors, particularly aircraft, are described wherein display panels 6 are releasably fixed to seat backs. The panels may require a release tool for removal from the seat backs. To preserve neatness of cabin decor, the panels are positioned so as to be concealed by tray tables 3 attached to the seats and foldable to overlie an area of the seat back, when the tables are folded. The rear surface of the seats may be covered with a fabric material having an opening corresponding in position and size with the display panel. Alternatively, each seat may be provided with a removable cover, with the display panel removably mounted on the fabric material of the cover.



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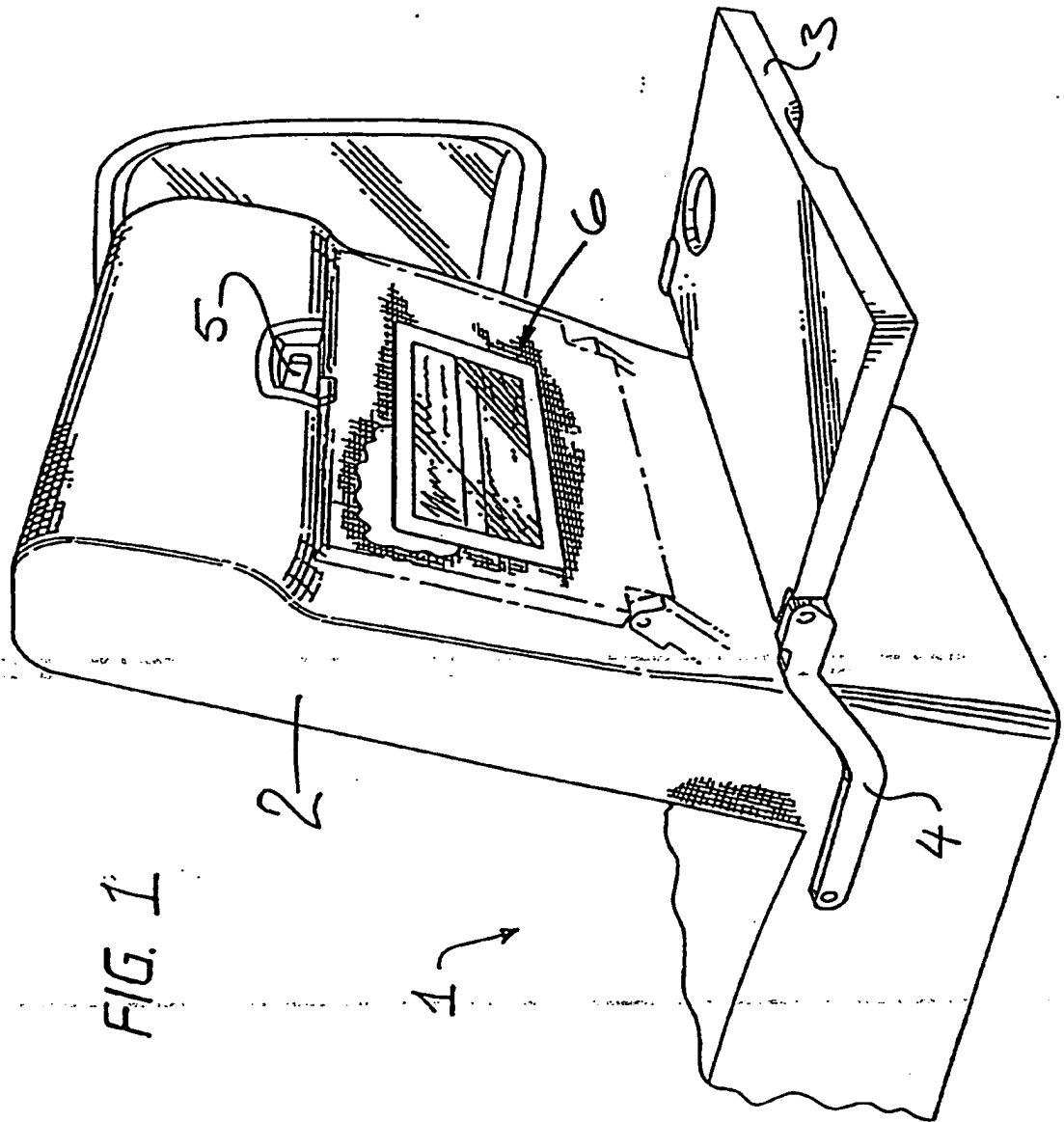


FIG. 1

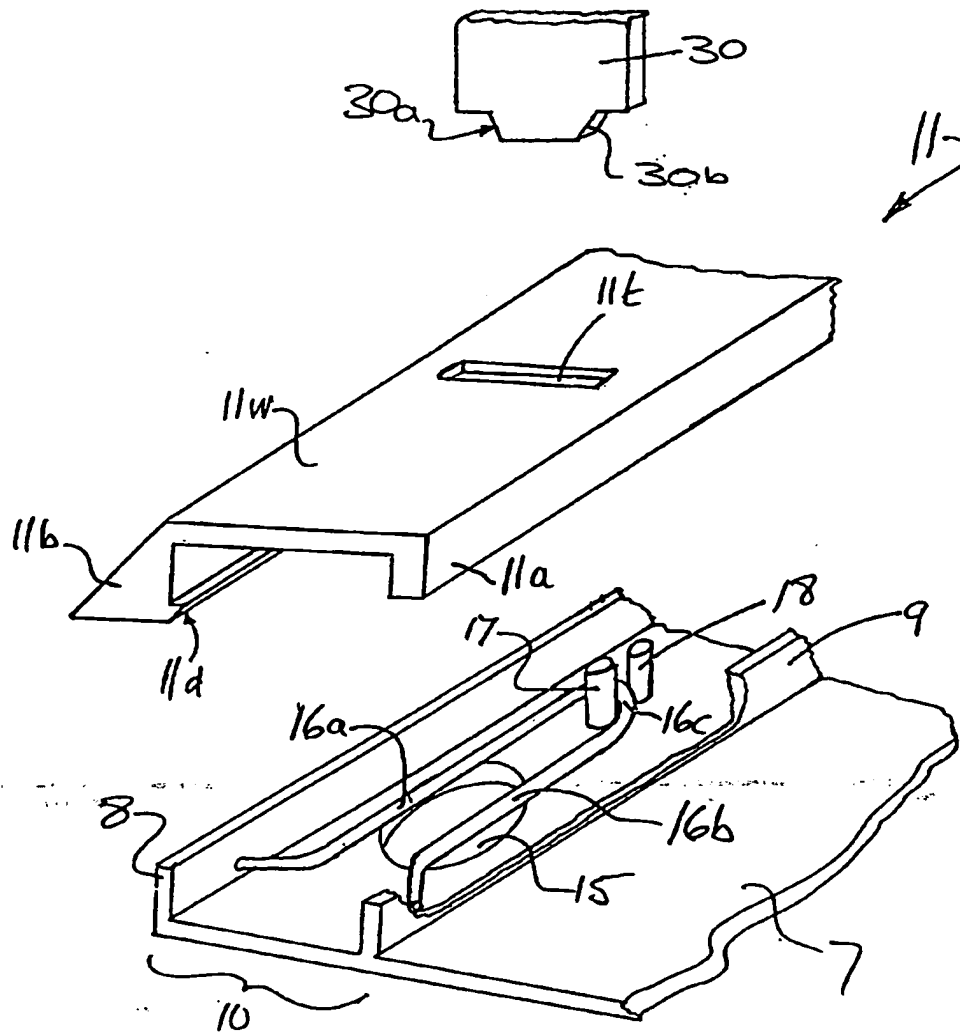


FIG 2

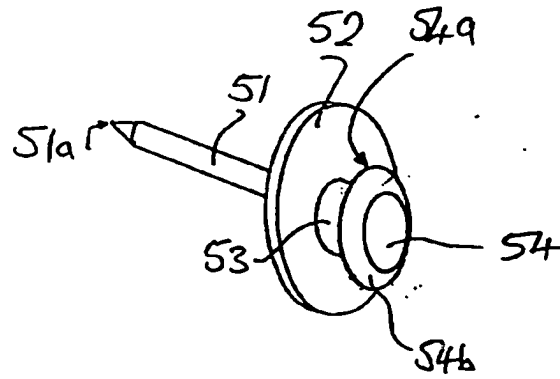


FIG. 3

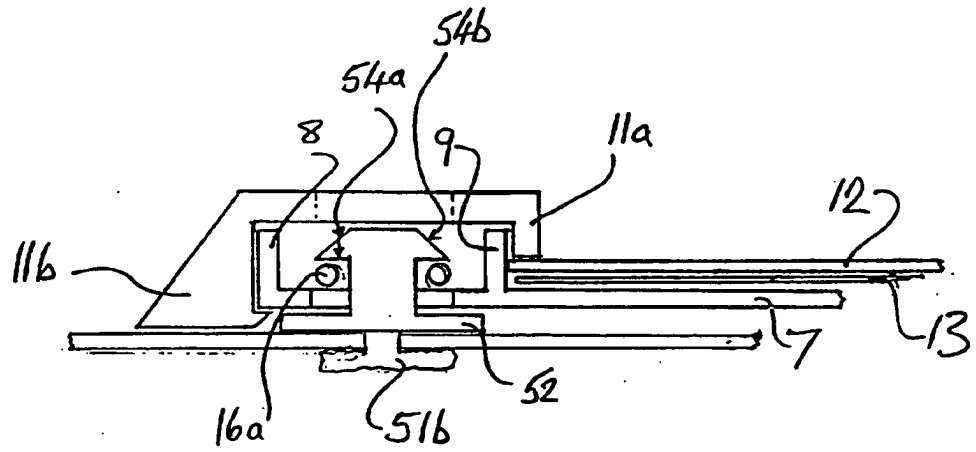


FIG 4

ADVERTISING PANEL

The present invention relates to display panels, and is particularly concerned with panels for displaying advertisements etc. in the interior of passenger vehicles such as aircraft, trains, coaches or the like.

US patent 5,010,668 describes an advertising device for displaying advertising material in the back of an airliner seat so that the material is visible at all times. There is also described a structure for the customary folding tray tables provided in airliners, wherein advertising material is displayed from the underside of the tray table so as to be visible when the tray table is in a stowed condition lying adjacent to the seat back.

There is also known an advertising display pocket formed from flexible film material and containing a printed insert, which display pocket is attached to a seat by adhesive bonding so as to be visible to a passenger seated in the next seat behind.

Aircraft operation is made economical only if the aircraft can be kept flying for the maximum proportion of its working life, and operators therefore strive to minimise the time required to "turn round" an aircraft at the end of a journey, in preparation for its next departure. In aircraft where advertising is to be displayed, there is a need periodically to change the

display materials, to cope with seasonal variations of product, or to publicise special offers for a limited time. The devices of the prior art require that each seat is visited, its display material removed from the display device or pocket, and new material inserted.  
5 This replacement of flimsy printed sheets is a time-consuming procedure and reduces efficiency of operation by delaying the aircraft "turn round".

Such arrangements have not found favour with vehicle operators, particularly with airlines, and thus there remains the problem of providing a form of cabin interior advertising which effectively delivers the advertiser's message and is acceptable to vehicle operators, and to airline operators in particular.  
10

The present invention seeks to provide a display panel for aircraft seats, which allows advertising displayed within the aircraft to be changed with the minimum prolongation of "turn round" time.  
15

The disadvantages of prior art devices are overcome in the present invention by providing an advertising display panel which is detachably mountable to a vehicle seat. Preferably the detachable mounting is effected by means of cooperating mounting means on the display panel and on the vehicle seat. More preferably, mounting studs  
20 are permanently or semi-permanently fixed to the seat and releasable cooperable with mounting structures on the display panel. Most preferably, release of the

cooperating mounting studs and structures is effected by a release tool or implement.

By detachably mounting the display panels to the aircraft seats, a change of advertising is achieved rapidly by removing the entire panel from the seat and replacing it with a fresh panel into which the new advertising material has already been loaded. The time-consuming operation of removing a printed sheet from each panel and replacing it with another is thus effected not in the aircraft cabin during 'turn round', but in advance at for example a warehouse or factory. The operation of exchanging a rigid panel on a seat takes considerably less time than exchanging the printed material, and the delay to 'turn round' is thus much reduced. The pre-loaded panels also serve to protect the advertising material in transit to the aircraft, ensuring the best possible appearance to the public.

According to a first aspect of the present invention the disadvantages of the prior art are overcome by providing a passenger seat having detachably mountable thereto a substantially rigid advertising display panel containing an exchangeable advertising insert visible through a display window of the panel.

According to a second aspect there is provided a passenger seat having a display panel releasably mountable thereto by mounting means comprising first and second cooperating mounting elements, the first mounting



element being fixed to the seat and the second mounting element being associated with the display panel.

In a preferred embodiment, the first mounting element includes an abutment and the second mounting  
5 element includes a movable detent which engages the abutment when the panel is mounted to the seat, and is movable to a release position wherein the first and second mounting elements are separable. Most preferably, the movable detent is resiliently biased away from the  
10 release position, and may be moved toward the release position by a release tool or implement.

An important consideration for airlines as regards their cabin decor is the initial impression which the passenger receives on entering the aircraft cabin. When  
15 considering interior decoration schemes, aircraft operators tend to favour an "uncluttered" look in order to give an impression of business-like competence to the passenger. It is for this reason that the preferred position for the display panel is that area of the seat  
20 back which is covered by the stowed tray table. When passengers enter the cabin at the beginning of the flight, the advertising is concealed and a neat and tidy impression is given.

According to a third aspect, a passenger seat having  
25 a generally planar tray table mounted for movement between a deployed position wherein the table occupies a generally horizontal position behind the seat back and

a folded position wherein the tray table lies adjacent the rear surface of the seat back, has an advertising display panel detachably fixable to the seat back and containing an exchangeable display insert visible through  
5 a display window of the panel when the tray table is in the deployed position, and concealed by the tray table when the tray table is in the folded position.

According to a fourth aspect, there is provided method of changing the display material displayed in a  
10 passenger vehicle provided with a display panel on the back of a passenger seat for new display material, comprising the steps of:

preparing a substitute display panel displaying the new display material;

15 removing the display panel from the seat; and  
mounting the substitute display panel to the seat.

Where the seat has a fabric covering, the display panel may be detachably mounted to the fabric covering material. Alternatively, the display panel may be  
20 detachably mounted to a rigid seat back panel, and if necessary a fabric covering may be formed with an opening through which the panel is visible, and through which the panel may pass during removal and refitting to the seat.

Embodiments of the present invention will now be  
25 described in detail with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of an aircraft seat;

Figure 2 is a partial exploded perspective view showing the mounting elements of a display frame;

Figure 3 is a perspective view of a mounting element to be attached to a seat back;

5        Figure 4 is a sectional view showing the display frame of Fig. 2 mounted to the mounting element of Fig. 3;

Referring now to the Figures, Figure 1 shows an aircraft seat 1 with a back 2. A tray table 3 is  
10 attached to the seat 1 by means of support arms 4. Pivoting joints at the ends of the support arms 4 allow the tray table 3 to assume a deployed position shown in solid lines in Figure 1, wherein the tray table 3 occupies a generally horizontal position behind the seat  
15 back 2. To facilitate cabin access, the tray table 3 has a stowed position, shown in chain lines in Figure 1, where the tray table 3 is in contact with the rear surface of the seat back 2. The tray table 3 is securable in the retracted position by means of a clip  
20 or fastener 5. In the retracted position, the tray table 3 overlies and obscures from view an area of the rear surface of the seat back 2.

A display panel 6, substantially as shown in Figures 2 and 3, is detachably fixed to the area of the seat back  
25 which is obscured by the tray table in its retracted position.

In Figure 2, an embodiment of the display panel 6

is illustrated in partial exploded perspective view. The display panel 6 comprises a substantially rigid back plate 7 which is generally planar and rectangular in form, and has a pair of peripheral ribs 8 and 9 defining a channel 10 therebetween. The back plate 7 may be a continuous sheet of material such as rigid plastics or light metal, or it may be perforated to form a lattice at its central region, to reduce weight. A transparent cover sheet 12, whose dimensions correspond to the dimensions of the area of the back plate 7 within the inner rib 9, is held to the back plate 7 area of the thickened edge regions 11a of a covering frame 11. The dimensions of an internal flange 11a provide a clearance between the transparent cover sheet 12 and the back plate 7 at the central areas of the back plate 7, enabling a sheet of printed material 13 to be inserted between the back plate 7 and cover sheet 12. Access to this interior space for exchanging the printed material 13 may be afforded via an opening in the back plate 7, or may be achieved by removing the covering frame 11 and transparent sheet 12.

~~At a predetermined number of locations round the~~  
periphery of the back plate 7, within the channel 10, the back plate 7 is formed with openings 15. A resilient spring 16 in the form of a "U" has its parallel legs 16a 16b extending across chords of the circular opening 15. The free ends of the legs 16a 16b are splayed to approach

the facing sides of the ribs 8 and 9 respectively. The curved portion 16c of the spring is held captive between two pillars 17, 18 formed on the back plate 7.

5 A covering frame 11, of the same shape as the periphery of the baseplate 7, is a generally inverted channel section having a web 11w, an internal flange 11a and an external flange 11b. The covering frame 11 is dimensioned to fit over the ribs 8 and 9 defining the channel 10, with the internal flange 11a lying adjacent  
10 the rib 9 and the external flange 11b lying adjacent the rib 8. A detent 11d on the external flange 11b snap-engages the underside of the baseplate 7 to retain the covering flange in place.

The web 11w of the covering flange 11 is formed with  
15 openings 11t, through which a release tool 30 may be inserted. The opening 11t is so positioned that the tool 3, when introduced through the opening 11t, engages the legs 16a, 16b of the spring with cam surfaces 30a, 30b, respectively, and causes the legs to be spread apart, for  
20 reasons to be described later.

The rear surface of the seat back 2 may be formed by a substantially rigid panel of, for example, plastics material. Alternatively, the seat back 2 may be covered with a woven fabric, either in the form of a fixed or  
25 removable cover.

Figure 3 shows a mounting element 50 for attachment to the seat back. The display panel is releasably

mounted on a number of these mounting elements or studs, which are fixed either to the seat back, or to a covering fabric.

When the rear surface of the seat is covered by a  
5 fabric, the studs shown in Figure 3 are fixed to the fabric at appropriate locations by inserting the pointed tip 51a of piercing shank 51 through the fabric until the flange 52 bears against the outside surface of the fabric. The piercing shank 51 is then staked using heat  
10 or an ultrasonic head to form the material of the piercing shank 51 into a flange 51b (shown in Figure 4) which underlies the fabric, clamping the fabric between this newly-formed flange and the flange 52. Alternatively, a backing component may be placed behind  
15 the fabric, and the piercing shank may be engaged and retained by the backing component to fix the stud 50 at its location on the fabric. Snap engagement is contemplated, or a threaded engagement between the shank 51 and the backing component is foreseen, but any  
20 suitable fixing may be used. Preferably the shank 51 is of a sufficiently small diameter that the stud 50 can be removed from the fabric without leaving a permanent mark. Multiple shanks on each stud are foreseen, in order to provide the required strength while reducing the diameter  
25 of each shank 51.

Extending coaxially from the flange 52 is a stud 53 with an enlarged head 54, the head having a frustoconical

shape. An undersurface 54a of the head faces toward flange 52, and a conical upper surface 54b of the head 54 acts as a cam surface, as will be described later.

When the rear surface of the seat back 2 is of a rigid material, then the display panel 6 can be fixed to the seat back 2 by bonding or otherwise fastening to the seat back 2 a number of mounting studs similar to those shown in Figure 3, but from which the piercing shank 51 has been removed. These studs may be attached by adhesive pads attached to the seat back 2 and to the underside of flange 52, or an adhesive material may bond the flange 52 directly to the seat back 2. Preferably an adhesive is used which allows the stud to be removed without marking the seat back.

In an alternative embodiment, a seat having a woven fabric seat cover may have its cover formed with an opening to correspond to the dimensions of the display panel 6, so that the display panel 6 may be fastened to an underlying seat back panel.

To attach the display panel to the seat, a number of mounting studs 50 are attached to the seat or seat cover in an array which corresponds in number and position with the openings 15 in the back plate 7 of the display panel. The panel is mounted to the seat by offering the panel up so that the heads 54 of the studs 50 enter respective ones of the openings 15. By pressing the panel firmly, the conical surfaces 54b of the heads

54 act as cams to urge the legs 16a 16b of the springs 16 apart. When the head 54 has passed between the legs 16a, 16b, the legs spring inwardly to underlie the abutment surface 54a of the head, preventing withdrawal  
5 of the head and holding the display panel firmly on the seat.

To remove the display panel, release tool 30 is inserted in release slot 11w to splay the legs 16a and 16b, allowing the head 54 to pass out through the opening  
10 15.

In display panels having a plurality of mounting studs and springs, a single release tool 30 will not completely release the panel in one operation. A plurality of release tools 3 mounted in an array may be  
15 simultaneously introduced into a plurality of release openings 11w in the covering frame 11, permitting rapid removal of the display panel.

To exchange the advertising material within the display panel, an opening or slot may be formed in the  
20 base plate 7 within the area bounded by rib 9. The advertising material 13 may then be removed only when the panel is dismantled from the seat, preventing unauthorised tampering.

In an alternative embodiment, not illustrated, a  
25 display panel is formed from a flat base plate and a flat transparent window, fixed together at raised edge regions of the back plate to define a generally planar central



cavity.

By displacing the edge regions from the plane of the central part of the back plate, rebates are created at the margins of the rear face of the back plate. The rebates may accommodate burr-type fasteners for releasably fixing the display panel to the seat back. The back plate in this or the previous embodiment may be formed for example from light metal such as pressed aluminium sheeting, or from plastics material.

Although the display panels described herein are rectangular in shape, it is to be understood that circular, elliptical, polygonal or any other suitable shapes may be used.

Although burr-type fasteners are described above, any other suitable fastening means may be used. The display panel may be releasably fixed to the aircraft seat back, for example by press-studs, burr-type fasteners, zips, or other suitable releasable fasteners.

The materials used in the construction of the display panels should be suitable to meet any fire resistance or other requirements made in relation to the materials of the seat back.

While the display panel is primarily intended for use in airline environments, seats equipped with display panels according to the invention may be used in any passenger vehicle to provide a neat and attractive initial impression to the passenger while simultaneously

enabling advertising material to be displayed to the passenger during his or her journey.

The structure disclosed for fixing the display panel to a supporting surface may be adapted to provide a  
5 concealed fixing for other purposes, for example for mounting a framed picture or a notice or sign to a wall. Such a fixing may find utility in public places such as restaurants, where the picture may be securely mounted by concealed fixings, but the frame may be removed from  
10 the wall easily for the picture to be changed to match the decor after redecoration, or if the wording of a sign or notice requires alteration.

CLAIMS

1. A passenger vehicle seat having a seat back, wherein a display panel is releasably mountable to the seat back so as to be visible from the rear.

5

2. A passenger vehicle seat according to claim 1, wherein the seat back has a first mounting means fixed thereto, and the display panel comprises a base with a second mounting means associated therewith, and wherein  
10 the first and second mounting means are cooperable to releasably attach the display panel to the seat back.

3. A passenger vehicle seat according to claim 1 or claim 2, wherein the attachment between the display panel  
15 and the seat back is releasable by a releasing tool.

4. A passenger vehicle seat according to any preceding claim having a tray table mounted to the seat for movement between a deployed position wherein the table occupies a generally horizontal position behind the seat  
20 back, and a folded position wherein the tray table lies adjacent the rear surface of the seat back, the display panel being releasably mountable on the seat back so as to be visible when the tray table is in the deployed position, and concealed when the tray table is in the  
25 folded position.

5. A seat according to any preceding claim, wherein the display panel comprises a substantially rigid baseplate and a transparent cover sheet fixed thereto to define a cavity therebetween into which display material may be  
5 inserted for viewing through the cover sheet.

6. A seat according to any of claims 3 to 5, wherein a first fastening element having an abutment is fixed to the seat and a second fastening element having a detent  
10 is associated with the baseplate, the detent being movable from an engagement position, in which the detent engages the abutment to hold the first and second fastener elements together, to a release position in which the detent is clear of the abutment and the first  
15 and second fastener elements are separable.

7. A seat according to claim 6 wherein the detent is urged toward its engagement position by a biasing means, and is movable to its release position by a releasing  
20 tool.

8. A seat according to any of claims 3 to 7, wherein the releasable fixing is effected by complementary parts of a number of fasteners associated with the baseplate  
25 and fixed to the seat back, respectively.

9. A seat according to any preceding claim, wherein the

rear surface of the seat back is covered by a flexible fabric material, and an opening is formed in the fabric material to correspond in position and size with the display panel.

5

10. A seat according to any of claims 1 to 8, wherein the rear surface of the seat back is covered by a panel of fabric material, and the display panel is mountable to the fabric material.

10

11. A seat according to claim 10, wherein the releasable fixing is effected by complementary parts of a fastener fixed to the fabric panel and associated with the display panel, respectively.

15

12. A seat according to claim 10 or claim 11, wherein the display panel is removably attachable to the fabric material by means of separable zip-type fasteners.

20

13. A seat cover for a vehicle seat, the seat cover having a back panel for covering the rear surface of the seat back, and a display panel being releasably attachable to the back panel so as to be visible when the seat cover is fitted to a seat.

25

14. A seat cover according to claim 13 for a seat to which a tray table is mounted for movement between a

displayed position wherein the table occupies a generally horizontal position behind the seat back and a folded position wherein the tray table lies adjacent the rear surface of the seat back, wherein the display panel is  
5 releasably attachable to the back panel in such a position that when the seat cover is fitted to the seat and the display panel attached, the display panel is concealed by the tray table when in its folded position.

10 15. A seat cover according to claim 13 or claim 14, wherein the back panel of the seat cover is separate from the remainder of the seat cover material.

16. A back panel for a seat cover according to claim 15.

15

17. A seat cover for a passenger vehicle seat according to any of claims 1 to 10, wherein the seat cover comprises a back panel to which is attached one part of a releasable fastener for mounting a display panel  
20 thereto.

18. A back panel for a seat cover according to claim 17.

19. A passenger seat substantially as herein described  
25 with reference to Figures 1 to 4 of the accompanying drawings.

20. A method of changing the display material displayed in a passenger vehicle provided with a display panel on the back of a passenger seat for new display material, comprising the steps of:

- 5       preparing a substitute display panel displaying the new display material;
- removing the display panel from the seat; and
- mounting the substitute display panel to the seat.

10   21. A method according to claim 20 wherein the passenger vehicle is an aircraft.



Application No: GB 9810858.2  
Claims searched: 1-21

Examiner: R A H CASLING  
Date of search: 23 June 1998

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G5C(CER,CFF)

Int Cl (Ed.6): G09F

Other:

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2311887 A (BHALLA) see page 4 line 16 et seq	1,4,5,9-18,20
X	EP 0779177 A2 (STEEN) see 2 line 44 et seq	1 and 2
X	WO 95/14588 A1 (HAFFNER) see page 12 line 1 et seq	1 and 4
X	FR 2677791 A1 (BELAIR) see figures 5,6 and 7	1 and 2

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.